Lessons Learned on Participatory Action Research to Adoption of Climate Smart Agricultural Options with an Emphasis on Gender and Social Inclusion

Working Paper No. 416

CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)

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About CCAFS
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Abstract

Participatory action research (PAR) has been around for years, and can add significant value to agriculture research for development projects. The use of PAR in climate-smart villages (CSVs) is no different. This review aimed to assess the impact that PAR approaches had on the adoption of CSA practices and technologies, with an emphasis on gender and social inclusion. Through a portfolio review, interviews with regional CSV teams, and surveys sent to local partners, this report demonstrates the benefit of PAR use in the implementation of the CSV approach. Specifically, the working paper discusses how the use of PAR methods can facilitate social learning, increase adoption rates and improve access to climate information services (CIS) to inform better decision-making. It can also foster conversations around gender roles and dynamics, improve women and youth's participation in CSA activities, and contribute to scaling. Additionally, PAR can provide communities with a sense of ownership over projects, which can make interventions more sustainable even after the project cycle has ended.

Keywords

Agriculture; climate-smart agriculture; gender; youth; participatory action research; climate-smart villages

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Lastly, we would like to thank Geraldine Rojas (CIAT) for analysing the Spanish resources and translating them so they could be included in this review.

Contents

Acronyms

CGIAR	Consultative Group for International Agricultural Research
CSA	Climate-smart agriculture
CIS	Climate Information Services
CSV	Climate-smart village
GSI	Gender and social inclusion
PAR	Participatory action research
PICSA	Participatory Integrated Climate Services for Agriculture

Introduction

While there is no single definition for participatory action research (PAR), it can be described as "a long term, collaborative process in which groups of people act together in iterative cycles of goal setting, analysis, planning, implementing, monitoring, and reassessing progress" (CIFOR 2008). Notably, common characteristics across different versions of participatory research methods are that they minimize the distance between end users and researchers through action and dialogue, and that they involve continuous learning from all the participants (Johnson et al. 2003). Participatory methods have been used in agriculture to increase adoption and improve the impact of innovations (Lilja & Ashby 2001).

Background on PAR in CGIAR

PAR is not new to CGIAR, and the use of participatory approaches in CGIAR dates back to the 1980s when researchers began to question whether farmers were actively participating enough and started to incorporate farmer collaboration into research (Becker 2000). Initially, participatory approaches were only implemented in individual projects, however, as knowledge and work with participatory research progressed, the approach started to become somewhat institutionalized within some CGIAR centers (Becker 2000).

A considerable amount of CGIAR's activities on participatory research were focused on technology transfer or research on adaptation. However, sometimes participatory research activities were implemented with strategic goals in mind such as methodology development; the system-wide initiative on participatory research and gender analysis is an example of this (Becker 2000). As part of this initiative, discussions were held on the end goal of farmer participation in research. One aim being to improve the functional efficiency of research (increased adoption, improved technologies, quicker scaling), and the second being empowering marginalized groups so as to give them a voice within the research realm (Ashby 1997).

The discussions noted that these two objectives are not mutually exclusive, and may often have conflicting criteria for success. For example, cost effectiveness would be an indicator for success under the functional efficiency goal, but perhaps not so much for empowerment, where improved capacity building would be a more significant result (Ashby 1997). However, another viewpoint from these discussions was that functional participation could not truly take place without the empowerment of marginalized groups (Ashby 1997).

The result of this discussion was that both functional participation and empowerment would receive attention from future work under the initiative. While these discussions took place over two decades ago, and PAR has since become a fundamental approach to CGIAR's work, this report presents a unique opportunity to assess both of the objectives of participatory research by looking at both adoption and GSI.

In CCAFS, the participatory evaluation of CSA options in climate-smart villages (CSVs) is listed as a core function of the flagship 2 program on CSA practices and technologies. Participatory approaches were also explicitly listed in the proposal when discussing how to engage youth. Additionally, the proposal mentions that research will "be embedded in local participatory platforms for understanding the social, gender and biophysical constraints and enablers for adoption" (CCAFS 2016). Key to participatory approaches in CSVs were partnerships, especially with local institutions. The CCAFS Phase II proposal even notes that CSVs are founded on PAR in order to appropriately take into account location- and context-specific enabling conditions (CCAFS 2016).

The CSV Approach and PAR

The use of participatory methods is central to the CSV approach. The CSV approach was proposed as a means to address the need for proven and effective location-specific climate-smart agriculture (CSA) options. Specifically, it is an agriculture research for development (AR4D) approach to test technological and institutional agriculture adaptation options through participatory methods (Aggarwal et al. 2018). It aims to co-generate bottom-up evidence on what the best climate-smart agriculture (CSA) options are for specific socio-economic, environmental and climatic conditions and use this evidence to inform stakeholders such as policy makers and development practitioners.

The climate-smart village (CSV) concept was developed in 2012, a year after the onset of the CCAFS program moved ahead of the traditional benchmark sites used to test and evaluate agricultural practices and technologies. The number of CSV sites evolved throughout the years, 15 sites were initially established in South Asia, West Africa, and East Africa before expanding in 2014 to Latin America and Southeast Asia. At the end of 2017, a total of 35 CSVs were established and managed by CCAFS and partners, covering 20 countries across all 5 CCAFS priority regions (see Figure 1). After that, further efforts focused on scaling through external partners (bilateral projects namely in South Asia), the number of CCAFS CSVs went down; there were 11 in 2021. Villages chosen for the CSV project were all areas that were at a high-risk to the impacts of climate change (Förch et al 2013). CSVs are envisioned as

"models" of local actions that enhance productivity, increase incomes, achieve climate resilience and enable climate mitigation (CCAFS 2013).

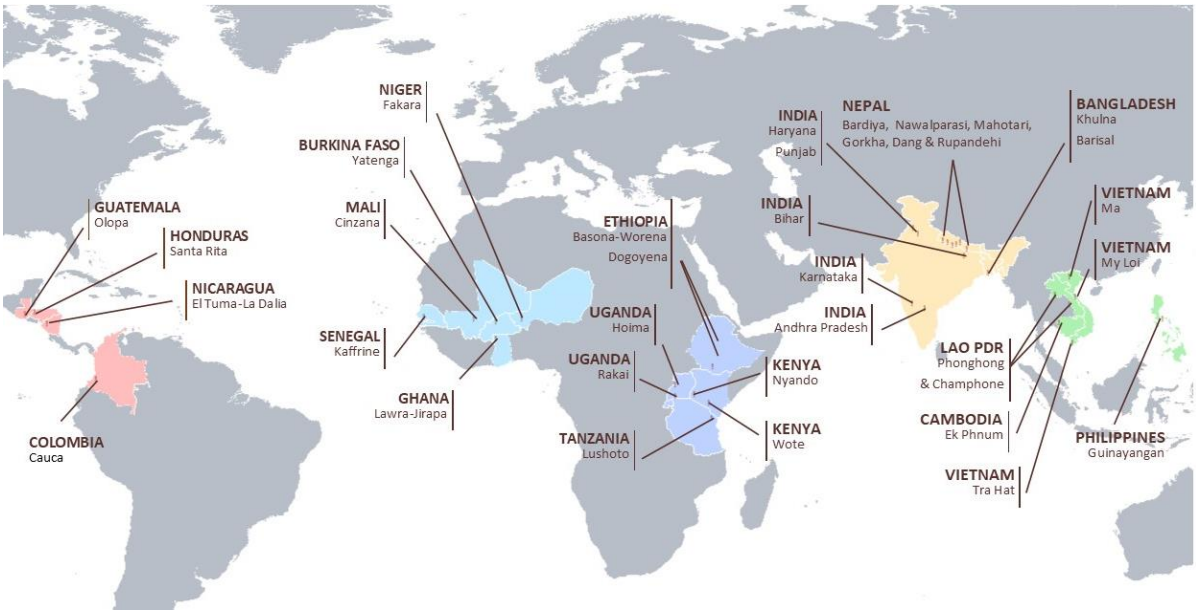

Figure 1. CSV locations over the course of the CCAFS programme cycle.

The CSV approach is "unique in the sense that it provides an AR4D platform for multi-stakeholder participatory evaluation of CSA options and links global and local knowledge with local and national policies, thus presenting a holistic vision for sustainable agricultural development as well as confronting climate change action in agriculture" (Aggarwal et al. 2018). The approach identifies, tests and promotes packages of climate-smart agriculture (CSA) technologies, practices, and climate-information services that are relevant to face the climate-related threats of a given CSV site. The aim of the CSV approach is to:

1. "Understand the effectiveness of a variety of CSA options (practices, technologies, services, programs, and policies) not only to enhance productivity and raise incomes, but also to build climate resilience, increase adaptive capacity, and wherever possible, reduce GHG emissions;
2. Develop (no regrets) solutions in anticipation of future climate change impacts;
3. Understand the socioeconomic, gender, and biophysical constraints and enablers for adoption; and
4. Test and identify successful adoption incentives, finance opportunities, institutional arrangements, and scaling out/ up mechanisms while ensuring alignment with local and national knowledge, institutions, and development plans".

The approach involves empowering farming communities through key components, which include: CSA practices and technologies, climate information services and insurance, local and national public and private institutions, national and subnational plans and policies, farmers' knowledge, and climate and agriculture development finance (Aggarwal et al. 2018).

As noted above, understanding the gender and socioeconomic constraints and enablers of adoption in the target area is a pillar in the strategy for a CSV approach. Likewise, considering gender and social inclusion is extremely important when aiming to scale CSA in an equitable manner. Women in agriculture often have less access to financial capital, advisory services, and productive resources/inputs compared to men (Nelson & Huyer 2016). This significant gap also in terms of control over those essential inputs and it has been documented globally is reflected on women and men different adaptive capacities, especially in developing countries (Huyer 2016).

Objective

This review aims to gather and present knowledge on the use of PAR and how it has influenced adoption within CSVs, specifically looking at GSI. It is important to clarify that the goal of the study is not to assess PAR in general, but lessons learned for using PAR as a mechanism to foster adoption of CSA with an emphasis on GSI. Specifically, the review aimed to answer the following key research questions:

1. How were PAR approaches used in CSVs to support CSA adoption beyond planning, with a GSI lens? Did PAR approaches address gender in/equality dimensions?
2. PAR is not a new concept, what was done differently or uniquely in the CSV approach? And specifically regarding GSI considerations?
3. Which have been the key successes? What have been the challenges/lessons learned? Based on these learnings, what needs to be done differently in the future?

To answer these questions, three methods of data collection were conducted: a portfolio review, interviews with CCAFS regional staff, and a survey for local partners directly involved in the CSV work. Since PAR is an approach to research, the resources included in the portfolio review often did not provide significant detail on the PAR processes used. As a result, much of the narrative for this report came from regional interviews and the survey.

Methodology

Phase 1: Portfolio Review

Work on this report began with the identification of resources to include in the review. The resources included a mix of journal articles and grey literature. The resources were found through searches on the CCAFS archive, CGSpace, and the Gardian. Filters were used to gain resources by CCAFS flagships, regions, and year. Resources that were published between 2013 and the time of the search (March 2021) were considered for review. Additionally, the following keyword searches were used to identify resources:

- Climate-smart villages AND participatory action research
- Climate-smart villages AND participatory
- Climate-smart villages AND gender
- Climate-smart villages AND youth
- Climate-smart agriculture AND gender
- Climate-smart agriculture AND youth

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) methodology (see figure 1) was followed for selecting the articles for review. The preliminary list of resources totaled 211, but after further screening (for resources that provided sufficient detail on participatory approaches in relation to gender and youth), there were a total number of 116 resources that were assessed in the portfolio review (see Appendix C for the full list of resources). Whether a resource was included or excluded was based on their applicability to the objective of the report, as well as those that were too brief/lacked sufficient detail to properly inform the data collection matrix.

The resource lists were sent to CCAFS regional teams for review and validation.

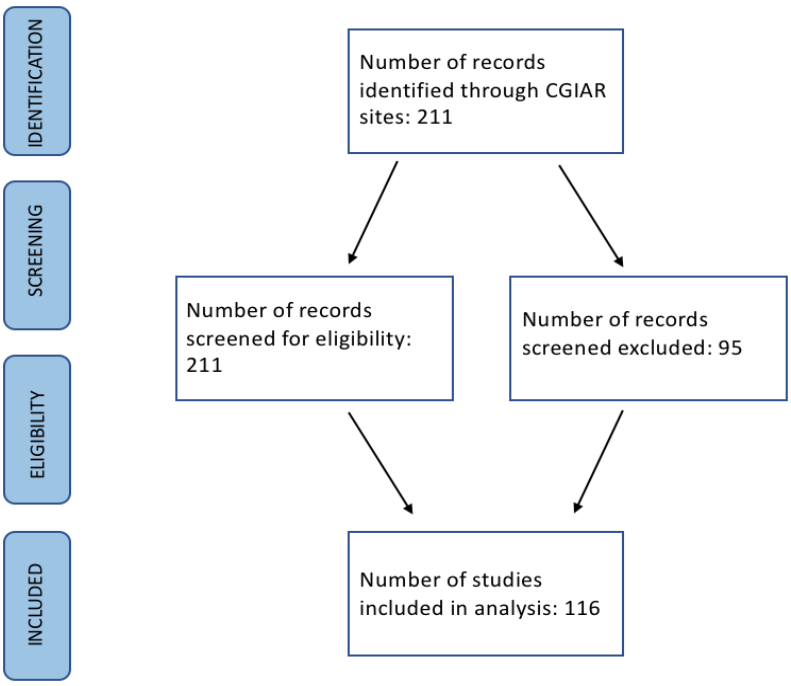

Figure 2. Process for resource identification and inclusion (adapted from The PRISMA Approach by Moher et al. 2009)

This review looked specifically at resources that focused on CSA practices and technologies at the farm-level, and did not assess resources that focused on the policy level. A review of CCAFS gender research done by Huyer et al. (2020) determined that GSI-inclusive scaling should be intersectional with four gender equality dimensions in relation to climate-smart agriculture, as developed by Tavenner, et al (2020), see figure 4 below. This review used these dimensions to assess progress on the use of gender-responsive approaches in CSVs.

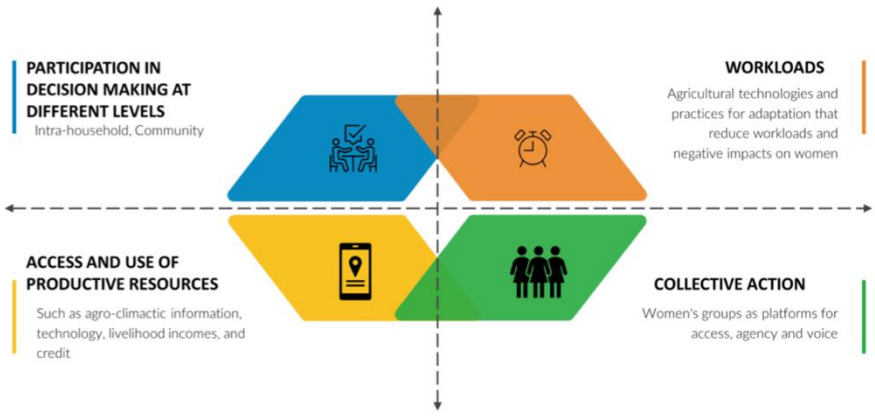

Figure 3. Four gender in/equality dimensions. Source: Tavenner et al. 2020

This review was done in connection with another report focused on gender and youth responsive CSA technologies tested across the CSVs (Beal et al. 2021). We collected data in

tandem for these two products due to their interconnectedness. PAR by definition should be inclusive of women and youth, so PAR approaches should be promoting gender- and youth-responsive technologies for adoption.

Data collected in the matrix as part of this review included (see Appendix A for the data collection template):

- PAR practices or approaches used in the project.
- Outcomes across the gender in/equality dimensions of climate resilience (Huyer et al. 2021):
    - Improved participation in decision-making at different levels: intra-household, community, national;
    - Improved control over/access to resources: such as agro-climatic information, technology, credit, and livelihood incomes;
    - Easing of workload: agricultural practices and technologies that decrease women's workloads and drudgery; and
    - Collective action: the use of women's groups as a pathway for improved agency, access, and voice.

Phase 2: Analysis and Validation of Findings

Upon completion of the portfolio review, an analysis of the data was conducted. Analysis was done disaggregated by region and involved visualizing the distribution of resources from each region across the entry points and dimensions listed above. In order to validate these findings, fill any knowledge gaps, and to capture the anecdotal information that does not make it into publications, interviews with each region were conducted. The interviews involved asking the regional CSV staff each of the research questions discussed in the introduction, and then validating the initial findings from our portfolio review. The list of resources reviewed for each region was also shared with and validated by the regional staff. A short survey was sent to local partners[1] that worked on the ground with CSV implementation in order to capture their inputs (see Appendix B for the survey questions).

[1] See acknowledgements section for the full list of survey respondents

Results

Descriptive from portfolio review

The majority of resources included in the portfolio review were journal articles, reports, info notes/briefs, and working papers (Figure 4). There were resources assessed for every year from 2013 through 2021, however, the majority of resources were from the years 2018-2020 (Figure 5).

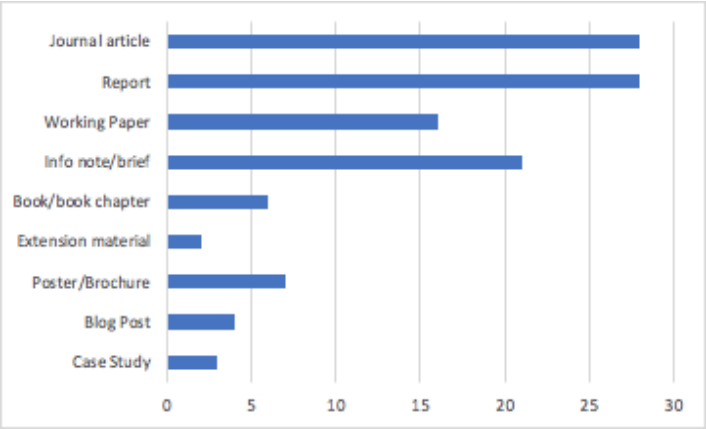

Figure 4. Amount and types of resources reviewed

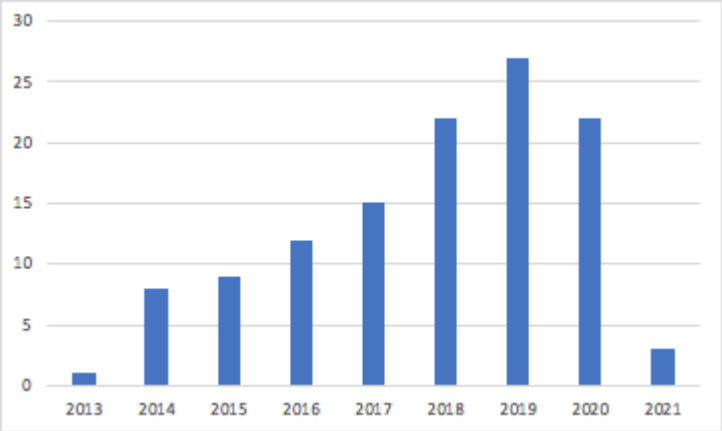

Figure 5. Distribution of the year of resource publication across all regions

The frequency in which the four GED outcomes were considered in PAR activities across the CSVs can be seen in figure 6. It is important to note that these are not necessarily intentional results, rather outcomes of the projects. Again, this does not claim to be a full reflection of what took place in the CSVs for each region, but what was recorded from the resources included in our review. The most common gender-related outcomes to which PAR approaches were included were collective action and access to/control over resources. It is

evident that these two outcomes were the most common across all the regions. Improved decision-making power occurred less frequently, but still across all regions, while the easing of women's workload was only present in three regions, and made up the least amount of outcomes.

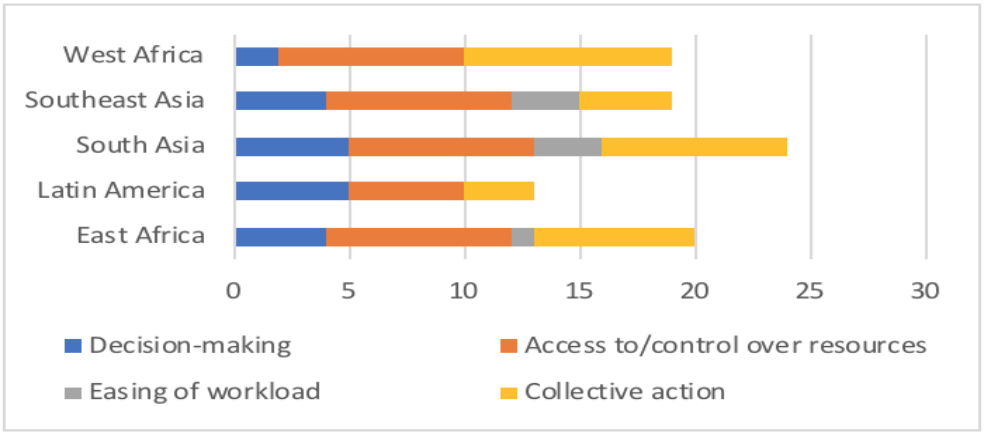

Figure 6. Distributions of outcomes across the gender in/equality dimensions.

Lastly, there was a large range of methods used in the context of the PAR approaches (Figure 7) that were used in projects that resulted in positive outcomes across the GEDs. It is important to note, however, that this is not a direct cause-effect relationship but an observation.

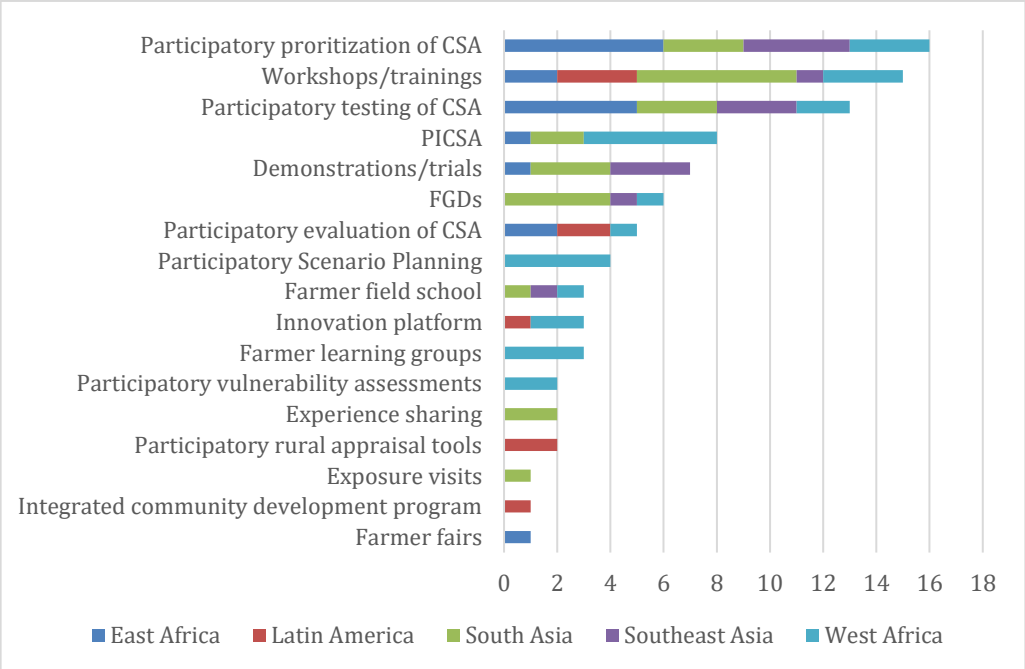

Figure 7. PAR approaches used in projects that resulted in positive outcomes across the gender in/equality dimensions (important to note that this is not a direct cause-effect relationship).

Regional Results

A breakdown of the results will first be discussed by the five CSV regions. There were some PAR approaches that were used across all regions, while others were only used in single regions (see figure 8). The participatory testing and evaluation of CSA options were both popular across most regions. However, the most frequently used approaches were workshops and trainings. Focus group discussions were used in multiple regions as was the participatory integrated climate services for agriculture (PICSA) approach. The PICSA approach's goal is to "to facilitate farmers to make informed decisions based on accurate, location specific, climate and weather information; locally relevant crop, livestock and livelihood options; and with the use of participatory tools to aid their decision making" (Dorward et al. 2015).

It is important to note that PAR includes a diverse range of stakeholders, as PAR is not just focused on individuals, but entire communities. Additionally, while the direct key players are the farmers and communities, PAR in the context of CSV work is participatory in the sense that it also involves stakeholders that are present in the area at different levels—it is not just bilateral research to the community. However, this report focuses mainly on the farmer level, as it was looking at adoption of CSA. An effort was made to include the voices of local partners through a survey sent out to partners for each CSV region.

East Africa

Participatory approaches used in CSVs in East Africa included: prioritization, demonstrations, testing, and evaluation of CSA technologies; technology development (enabling farmers to provide feedback e.g on the productivity levels of improved varieties); the Integrated Climate Services for Agriculture (PICSA) approach (to help farmers make use of climate information services); workshops and training; focus group discussions; and farmer fairs. Farmer field days took place every season with champion farmers and were helpful activities to improve the adoption of CSA.

Regarding novel PAR approaches used in CSVs, according to regional staff, the use of PAR improved farmer's use of forecasts. Farmers have learned to make use of weather forecasts and were able to improve their decision-making on land preparation, planting, and agronomic practices. Additionally, farmers have learned the importance of group formation (whether cooperatives or community-based organizations) to be able to negotiate with buyers to secure a premium price for their product. According to the local partners, the use of PAR in CSVs differed from most other approaches because it addressed the increasing need to incorporate an element of community participation into agricultural research.

Community involvement in the identification of problems and solutions is seen as the key to adoption and adaptation of new technologies. Therefore, PAR processes have been identified as crucial for sustainable agriculture and hence sustainable rural communities.

The community-based organizations included the gender and social inclusion aspects in their work through women and youth taking lead roles in specific activities within the CSV's PAR activities. Women and youth took leadership positions among farmers groups, conducting training (farmer to farmer extension), table banking, involvement in project planning meetings, mobilization of other farmers and the implementation of CSA technologies. In the East Africa CSVs, most GSI outcomes were related to improved access to and control over resources, followed by collective action.

Through PAR use, women's and youth's implementation of CSA practices increased. Increases were also seen in the establishment of climate smart farms which are used as learning sites for farmers, crop and livestock production, and income among farmers through the sale of farm products. Additionally, increased access to credit facilities, improved livelihood of communities and promotion of peace among the two neighboring communities through interactions during farmer exchange visits were realized. Increased group based interventions, such as smart-farms, was another key success of PAR use in East Africa.

However, there were also some challenges with PAR use. Some partners brought new technologies for implementation without involving the local community and this led to a lack of ownership and commitment from the community. Additionally, lack of funds to fully implement certain CSA technologies was a challenge for many farmers, e.g. irrigation technologies that require water pumps. Lastly, in some cases group dynamics presented difficulties, as some members were not keen on cooperating with group work that required labor.

East Africa Highlighted Case Study:

GSI Benefits from CSA Options Tested in East Africa CSVs

This case discusses the adoption of CSA technologies tested across CSVs in a participatory manner in East Africa. The results show an increase in uptake of CSA technologies and innovations across the CSVs, coupled with improved agronomic and livestock management practices.

Culture, experiences and micro-climate were found to be important factors impacting farmer's choices of CSA options. This emphasizes the importance of using PAR approaches that take local knowledge into consideration in order to enhance the adaptive capacity of farmers and their communities. Specific participatory approaches used included the participatory selection and testing of CSA practices, on-farm demonstrations, farmer fairs, and exchange visits.

As a result of the project:

- Collective action:
    - Women form about 80% of active membership of the community groups through which CSA interventions are channeled
    - 60% of women and youth reported being members of groups (an increase from 20% previously)
- Various CSA options were specifically tested with women, including small ruminants and poultry production, which requires limited labor and provides women greater control over the returns.
- In this study, women were found more likely to adopt CSA options than men, suggesting that CSA technologies and practices can be a practicable option for empowering rural women.
- Smart farms were found to facilitate adaptation learning, and were largely managed by women and youth.

Source: *Uptake and Impact of Climate-Smart Agriculture Technologies and Innovations in East Africa* (Radeny et al. 2018)

West Africa

In West Africa, PAR was used for the participatory prioritization, testing and evaluation of CSA. For the prioritization they did it separately for men and women, and women's groups were involved. Additionally, the PICSA approach was used and now CIS is becoming mainstreamed into their decision-making. In the PICSA approach, women were targeted to ensure that they have access to that information. Other PAR approaches used in West Africa

include: participatory rural appraisal tools; focus group discussions; workshops/trainings; field demonstrations; participatory planning tools; PICSA approach; participatory technology development; innovation platform; and farmer field schools.

The application of PAR methods into the CIS work was a new approach in West Africa. For the PICSA approach, the women's participation was a focus. Face-to-face meetings were used to communicate seasonal forecast in order to improve women's access to CIS. Additionally, climate smart technologies and practices have been identified and prioritized based on both the climate of the locality and the socio-economic conditions of the farmers. This prioritization process aimed to target various groups with the most relevant technologies for them and this includes women- and youth-specific options.

A key success regarding PAR use in West Africa CSVs is the training and capacity building of women. More women are now involved in the system and their capacity to implement some technologies and practices have improved. Group based approaches were also found to work well for women farmers. Additionally, a local partner added that men have started discussing farming options to be deployed in their farms with their wives, which was not the case before. CSV sites in Ghana are also becoming learning platforms for many stakeholders in relation to climate-smart interventions in agriculture.

One challenge faced in the West Africa CSVs is that while women's participation has increased, it is still not enough. There are also some specific constraints for women that need to be considered for certain technologies. Women still face constraints in regards to implementing some CSA options and projects need to be better about accounting for women's opportunities and needs. Additionally, the challenge of maintaining strong partnerships was noted as a challenge, as was the difficulty of linking the sub-national and national levels.

West Africa Highlighted Case Study:

Promotion of Gender and Youth Participation in CSV Activities through PAR Approach

The project used participatory action research to test combinations of innovations to achieve the pillars of climate smart agriculture. A focus on the role of women, youth, and marginalized groups in benefits sharing and decision-making was viewed as vital.

The vulnerabilities of gender-differentiated groups were mapped in order to create a baseline upon which to compare impacts of the project activities. Gender-specific activities were a focus of the project and separate focus group discussions were held for men and women. The entirety of the project was approached in a participatory manner.

CSA practices were identified and tested to determine the most well-suited agricultural practices at the plot, community, and landscape levels. Gender-sensitive activities for women that were implemented included: vegetable diversification, planting of fruit trees, improved varieties, nutrition education, and village savings and loan scheme. Meetings, trainings, and fieldwork all involved some women and youth. As a result of the project:

- Gender Climate-Smart women groups were trained on the use of stone lining, compost, stone bounding for soil and water conservation and they have adopted these practices for rice and maize production on fields that are prone to gully erosion.
- Interventions were implemented to provide immediate short-term income and food benefits to resource-poor women in the communities, allowing farmers to plant trees that would generate other substantial benefits in the longer-run.
- The project has been trying to support the community's recognition of women and youth's entitlement to their own assets by working with chiefs and elders, encouraging men and women to participate in joint decision-making, and supporting continued dialogue about women and youth's role in agriculture.

Source: *Towards developing scalable climate-smart village models: approach and lessons learnt from pilot research in West Africa* (Bayala et al. 2016)

Latin America

In Latin America, every aspect of the CSV project was participatory. Apart from design, the team worked with local partners and the community on the implementation of

interventions. Additionally, the team assessed outcomes throughout the project cycle with the community and local partners and tried to involve everyone in the process as much as possible. GSI was considered in PAR practices beyond planning. For example, in Colombia, participatory community workshops were used to gain perspective on gender roles and CSA practices. In Guatemala, a workshop used the Integrated Community Development Program (ICDP) as a common thread to illustrate how to use specific methodologies and tools to integrate gender aspects in the planning, implementation and monitoring of an intervention.

The PAR methods used in Latin America according to the portfolio review included: participatory needs assessment; participatory rural appraisal tools; participatory evaluation of CSA; focus group discussions; innovation platforms; farmer field school; workshops and trainings; resource and risk mapping; and the Integrated Community Development Program. The team in Latin America always made sure to have both men and women participate in the CSV activities, and believe this was essential for achieving gender outcomes.

Regarding unique uses of PAR, the entire process and implementation of the CSV approach was led by the communities and the community understood it was a process that they had to own. This was a core aspect of the implementation of the CSV approach in Latin America. It has also been very demand-driven and the team tried to discuss everything with the community to understand which activities were most relevant and necessary. The local partners were considered equal to the research team and they listened to them in everything they did—this made a difference in the approach. A local partner added that participatory action is the driving force of the CSV approach-- producers actively participate, make decisions and prioritize what they need (both men and women), the partner's role has been to facilitate the experience.

Ecohabitats, a partner in the Cauca CSV in Colombia, mentioned that due to PAR processes, researchers from CCAFS, Ecohabitats and knowledgeable people from the community were able to develop a real process of co-creation of adaptation measures, allowing its multiplication within the Cauca department and its scaling to other Colombian regions. Additionally, multiple partners mentioned that gender was very integrated into projects and the equal participation of men and women was promoted.

It was noted that a key aspect to the success of the CSVs in Latin America was having local partners implement the process in the field, as they have the capacity to scale the project. The team also made sure to strike a balance in the evidence/data they wanted to gather, and how stressful or intense this may be for the community. Successes mentioned by local partners were the active participation of women in CSA work, women's control over how to

use the benefits from the work, as well as experimenting with ideas that increase the resilience of productive systems. Empowerment of both men and women and the ability to recognize which CSA practices they need to implement for the management of their crops in the face of climate variability were other key successes.

In the Cauca CSV specifically, successes included transcending the topic of gender into a 'family approach,' the ability to generate institutional and community articulation platforms through the Ecohabitats and CCAFS alliance, facilitating scaling up through integration of CCAFS Tools and Ecohabitat Foundation's local adaptation plans, and being able to involve local communities in the co-creation processes for planning, scaling up, research and dissemination of the CSA.

A challenge for the regional team was that in the Cauca CSV, the community did not feel as though the scientific results were very beneficial to them. Determining how to better communicate the results of the findings is essential, especially given how time intensive research can be. A local partner noted that in the Cauca CSV, the main challenge was getting the scientists to understand the necessary processes for community work and developing the capacity to generate processes of homologation of languages and pedagogical skills to generate an exchange of knowledge with local organizations.

Other challenges noted by local partners include low interest of young people in participating in the project, lack of land ownership by some families, low rates of schooling, and farmer's lack of access to economic resources.

Latin America Highlighted Case Study:

Use of Participatory Approaches Contribute to Improved Integration of Gender at Regional and Global Levels

This project aimed to support the scaling up of gender sensitive Climate Smart Agriculture (CSA) as a mechanism to increase resilience and improve livelihoods of vulnerable households in the face of climate-related impacts in Central America.

Overall, the project aligned with and built on CCAFS' learning platform for participatory evaluation of CSA. PAR approaches such as participatory evaluation of CSA options and participatory capacity building workshops (involving farmers as well as local, national and regional organizations) were used to achieve the following results:

- Farming communities have increased adoption of CSA practices and technologies.
- Strategic CSV partners and local stakeholders from Olopa and Santa Rita have improved awareness and knowledge on gender issues/dynamics that affect adoption of CSA options.
- They are able to identify further CSA capacity building needs and entry points to mainstream gender sensitive CSA options into their interventions. Overall, they also have improved capacities to design, plan and monitor new CSA and gender sensitive interventions.
- The Central America Agricultural Council (CAC) and national institutions from Guatemala and Honduras co-developed a working plan to implement a gender component of the CSA regional strategy.
- Strategic staff in the Ministry of Agriculture and Livestock (MAGA) of Guatemala, in the Secretary of Agriculture (SAG) of Honduras and governmental institutions staff in Central America have improved knowledge and skills on how to incorporate gender in micro and macro level policies. They are also able to identify concrete mechanisms to use tools and/or gender inclusive CSA approaches within their initiatives/programs/projects.

***Source**: Generating evidence on gender sensitive Climate-Smart Agriculture to inform policy in Central America: Final Technical Report* (Bonilla-Findji et al 2020).

South Asia

In South Asia, the use of PAR in CSA adoption beyond planning can be seen in convergence activities-- a convergence of resources to address CSV needs. In addition to donor funds, the region raised funds that helped to ensure the sustainability of the program. They have also worked with women's groups and encouraged them to participate in dialogues with different stakeholders to help them understand how their needs can be met through the

different convergence approaches. Additionally, gender was integrated across key stages of the project through activities such as: training on the use of gender-inclusive technologies; constant communication with men and women about the importance of gender inclusion in agriculture; and farmer workshops to better understand the contextual challenges related to climate change and agricultural production, as well as gender roles.

The following PAR approaches were used in South Asia: trainings and workshops; demonstrations and trials; entrepreneurship capacity building; experience sharing and farmer-to-farmer learning exchanges; farmer field schools; the participatory prioritization and testing of CSA technologies/practices; Participatory Integrated Climate Services for Agriculture (PICSA) approach; exposure visits; and focus group discussions.

Novel PAR methods in South Asia included, having gender considerations and climate risk components considered together and the integration of PAR into CSA prioritization and testing. The implementation of a CSV in Nepal was done in a participatory and collaborative approach especially with the local governments and research institutions. The activities in the field were designed in participation and consultation with the local farming communities comprising youth, women, and local government's officials. The GSI aspect was well integrated while designing and promoting CSVs in Nepal.

In South Asia, the involvement of women in budgeting for all inputs and outputs was a success, as was attracting youth towards climate-smart management practices**.** Additionally, the strong buy-in from the local and provincial levels of government worked well when using PAR approaches. The consultation meetings, field visits mainly in the form of travelling seminars with the local/provincial authorities and sharing the results of the work done jointly was a key success. It was also noted that PAR certainly helps in horizontal scaling because it mobilizes the community-- researchers are not forcing approaches that they see fit—it's coming from the people. Due to this, scaling in similar typologies becomes easier. Lastly, PAR helped with the convergence of different activities/schemes/projects in CSVs that helped to identify the right technology at the right time to address relevant challenges. Lastly, due to PAR approaches, youth were exposed to new smart techniques and applications that resulted in more inclusion in agri-business.

A local partner noted that the main challenge when it comes to the implementation of new, innovative approaches or experimental research is the support from farmers and stakeholders. In the beginning, challenges were mainly associated with the perception of farmers with regards to the technologies being used in the CSVs. Another challenge was the short-term duration of some CSV projects. Though it takes more time to assess the results

before any technologies or practices are adopted, a long-term engagement with the key stakeholders is required in case of research conducted in CSVs in Nepal. Thus, any source or programme needs to be at 4-5 years duration to see the outcome of the activities. Convincing the community of the long term effects of climate on agriculture was another challenge, as was managing the plans and activities of different stakeholders, which can often be rigid.

South Asia Highlighted Case Study:

Women's Empowerment Through Participatory Approach to CSA Activities and Technology Adoption

This project used an integrated participatory approach to empower women farmers through various activities and technologies. Conscious efforts were taken throughout all stages of project design and implementation to include women farmers as active participants, not solely beneficiaries. The participation of women farmers was encouraged throughout every stage of the project through community-based groups.

A baseline assessment was conducted to understand the dynamics of the communities in each district where the project was taking place. The baseline assessment informed the design of a diversified set of interventions for women farmers. The following results came out of the project:

- Women's enhanced access to CSA technologies through the use of gender-inclusive techniques such as Direct Seeded Rice (DSR), biogas and weeder which significantly reduce the drudgeries of women farmers.
- Creation of a platform for women to improve agency, confidence and decision-making at the community level while pursuing income generating opportunities.
- Custom hiring centers allowed women to earn income, develop their entrepreneurial skills and contribute to their improved agency.
- Membership in village climate management committees allowed women to develop leadership and social skills.
- More than 4,500 women farmers directly benefitted through the program. A total of 318 women farmers initiated entrepreneurial activities after capacity building exercises, resulting in 182 individual and group-based enterprises.

Source: *Gender Integration for Inclusive Adaptation to Climate Risks* (CCAFS & BAIF 2020)

Southeast Asia

Examples of PAR use beyond planning in South Asia can be seen in the Agro-Climate Information Services (ACIS) and Photovoice projects, as well as roving workshops. ACIS incorporated aspects of GSI into all of its programming (see success story highlighted below). Photovoice is a participatory method that allows farmers to share their experiences through photos and images. The documentation of climate change related issues through this project can be used to inform policy makers and development organizations of the challenges facing farmers every day. Additionally, photovoice serves as a knowledge-sharing platform for farmers, enabling them to discuss effective climate change adaptation practices. Roving workshops gathered participants from the Southeast Asian region in order to share best practices for CSA implementation and conduct field visits to CSV sites.

Other PAR approaches used in Southeast Asia CSVs include: participatory scenario planning; focus group discussions; multi-stakeholder meetings; learning community approach; farmer learning groups; workshops and trainings; participatory vulnerability assessments; participatory action demonstrations; the participatory selection, testing, and evaluation of CSA; trials and demonstrations; and farmer field schools. A local partner noted that they always applied GSI by engaging different social groups in the community in the process of situation analysis, CSV development and CSA piloting.

Regarding unique PAR use, local partners noted that PAR worked very well during the implementation of the CSV projects. In Vietnam, the team managed to involve and engage different stakeholders, such as farmers, local traders (private sector), authorities and officers from the commune, district and provincial level officials, and the National Target Program on New Rural Development. Another partner noted that PAR was unique because it put a premium on processes and social considerations.

In Laos, participatory action research was strongly driven by climate change, especially in the aspect of adaptation. In the first phase of the project implementation, gender and social inclusion considerations were integrated in situation analysis and needs assessment, with an equal presence of women and men in the planning and selection of CSA interventions whenever possible. Outcomes of PAR included small CSA projects that are community-driven and sustained by the community with minimal or no additional support from CCAFS.

In multiple CSVs in Southeast Asia, teams guaranteed 50% or above participation of women farmers in implementing the project and women were given equal ownership of the project as men farmers. This encouraged women to learn and communicate those learnings to their community. Many women farmers became more confident in sharing knowledge, presenting

their thoughts and ideas in public and to local officials. They dared to challenge provincial officials about the province's development policy and support. Together with men participants, the women became farmer extension officers and ambassadors to promote CSA technologies and practices and showcase how CSVs can enhance adaptive capacity and resilience.

The International Institute for Rural Reconstruction (IIRR) set up a community support fund for its CSV in the Philippines to ensure that women were given preferential access to support for CSA adoption (fruit trees, native pigs, native chickens). Due to this, the local community is able to carry out the CSV work after the CCAFS project is phased out. Using PAR in Laos showcased the importance of women's role in climate change adaptation as they were more receptive to the introduction of new technologies and practices. Another key success of PAR use in the Laos CSV is the acceptance of gender inclusion by the government and NGO partners in implementing the project. According to a local partner, there is also a notable increase in the participation of women in decision-making during planning and project implementation, suggesting a level of women empowerment within the community.

One of the main challenges with PAR use in Vietnam was the limited commitment of the provincial and district stakeholders. This was due to the absence of policy for supporting CSA and CSV implementation at the time and even now. They could not do more because there was no budget and policy for CSA and CSVs. Another challenge was frequent cuts in funding allocations which resulted in having to leverage funding elsewhere. The lack of social scientists in some of the CGIAR centers, limited knowledge/expertise on gender, and the time intensiveness of PAR were also noted as challenges.

Lastly, the inclusion of gender and youth itself was a challenge. In Laos, the participation of women in planning and implementation of a particular CSA technologies and practices deviates from an accepted standard and norm**.** The team strongly advocated to government partners and village leaders that equal participation of gender is almost a prerequisite in conducting activities. Youth participation (especially village youth) was almost non-existent in the project due to the migration of youth to urban areas and cross-border migration, leaving older members of the family to tend for the land. This migration trend in Laos youth hinders the passing of farming practices from one generation to the next.

Southeast Asia Highlighted Case Study:

Engaging Women in Vietnam through the ACIS Program

The Agro-Climate Information Services (ACIS) for Women and Ethnic Minority Farmers in Southeast Asia Project emphasizes that actionable agro-climate information starts with—and responds to—gender-based needs of farmers, integrated at all stages of the value chain.

The ACIS project was designed with a GSI approach and focuses on the inclusion of women and ethnic minority farmers. The project conducted Participatory Scenario Planning meetings so users could co-design the agro-advisories. Women and men were given equal opportunities to join new practices when they were introduced. As a result of the project:

- Women gained more influence in agricultural decisions both at home and in the community since the advisories were discussed in interest or saving groups.
- Improved CIS resulted in better resource use efficiency, including less labor.
- The project had both male and female facilitators, which helped to promote gender equality.
- Compared to control sites, the agro-climate information services helped to reduce yield variability.

Source: *Participatory agro-climate information services: A key component in climate resilient agriculture* (Simelton et al. 2019)

Discussion

While each region had its own unique experiences with PAR approaches, there are common, cross-cutting themes that can be distilled.

PAR can improve the adoption of CSA

Regions mentioned that PAR approaches were key factors influencing the uptake of CSA options. The use of PAR in CSVs differed from most other approaches because it addressed the increasing need to incorporate an element of community participation into agricultural research. Community involvement in the identification of problems and solutions proved to be key to the adoption of new technologies. For this reason, PAR processes have been

identified as crucial for sustainable agriculture and hence sustainable rural communities in East Africa. Additionally, by using participatory approaches, more women in West Africa are now involved in the system and their capacity to implement CSA technologies and practices has improved.

In Southeast Asia, PAR demonstrated the importance of women's role in adaptation because they were more receptive to the introduction of new technologies and practices due to participatory approaches. Additionally, in Latin America, women's implementation of CSA and their control over the benefits from those CSA activities increased from participatory approaches. It is evident across regions that taking a participatory and inclusive approach can positively influence the adoption of CSA. PAR also improved the engagement of youth in CSA activities. For example, in South Asia, due to PAR approaches, youth were exposed to new techniques and applications that resulted in increased inclusion in agri-business.

PAR facilitated social learning

Since PAR aims to bring together various stakeholders, it is not surprising that the use of PAR approaches fostered social learning. In East Africa, South Asia, and Southeast Asia, more climate-smart farms were developed, which were used as learning sites. In Ghana, CSV sites themselves were becoming learning platforms for stakeholders to discuss CSA interventions. In Southeast Asia, the photovoice project served as a knowledge-sharing platform for farmers, enabling them to discuss effective climate change adaptation practices.
These examples show that not only are PAR approaches useful for influencing adoption of CSA, but these methods are also useful for continued learning and creating opportunities for farmers to share knowledge. Additionally, IIRR did work on social learning through the establishment of farmer learning groups. These groups were a platform for knowledge sharing and they were implemented in multiple communities in the Philippines. They found that knowledge generation through these small farmer learning groups was effective for identifying and refining appropriate CSA options, and even helped accelerate the adoption of technologies and practices (Mendez et al. 2021).

Participatory approaches used to address gender roles

In multiple regions, the use of PAR facilitated discussions around gender roles in agriculture. For example, in Colombia, participatory community workshops were used to gain perspective on gender roles and CSA practices. While in Southeast Asia, the participation of women in planning and implementing CSA technologies and practices challenged the gender standard and norm. These examples suggest that the use of PAR can not only influence farmers at the household level, but can impact their roles in communities as well.

PAR methods provide communities with a sense of ownership over project activities

An interesting finding from almost all regions was that the use of PAR processes made interventions more sustainable beyond the CCAFS project cycle. For example, in Latin America, since the whole CSV approach was locally-led, the communities understood that it was a process they had to own. The CSV activities were very demand driven by the local community, and this provided them with a sense of ownership over the project. In Southeast Asia, notable outcomes from PAR use were small CSA projects that were community-driven, and therefore sustained by the community with limited/no additional support from CCAFS.

PAR is helpful for scaling

The use of participatory approaches was also noted as being beneficial for scaling. In South Asia, it was expressed that PAR helped in horizontal scaling because it mobilized the community. Instead of researchers choosing approaches as they see fit, it came from the communities. As a result, scaling in similar typologies became easier. In Colombia, there was a similar experience. Due to the use of participatory methods, CCAFS and the local partner, Ecohabitats, were able to engage the community and develop a real process of co-creation of adaptation measures, allowing its multiplication within the Cauca CSV and its scaling to other regions. CSVs are participatory in the sense that they include a diverse array of stakeholders, not just farmers. The inclusion of various stakeholders, across different levels, is an important factor for scaling.

PAR was also helpful for vertical scaling. In Southeast Asia, the region started out with 7 CSVs but reached 90 due to the efforts of various partners. Scaling was achieved through a combination of the following pathways: knowledge transfer, policy incidence, commercialization, technology-driven and institution-driven processes (Barbon et al. 2021). In South Asia, CSA technologies and services were scaled up in vulnerable areas of India (Chanana et al. 2020).

Challenges in Relation to PAR Use

While the benefits of PAR are evident, there are challenges to its use as well. The most common challenge across regions was managing group dynamics/coordination between partners and groups. In South Asia, managing the different plans and activities of various stakeholders was found to be difficult. Maintaining strong partnerships was noted as a challenge in West Africa, in addition to the difficulty of linking the sub-national and national level. Southeast Asia had a similar challenge with limited commitment from provincial and district level stakeholders. Group dynamics can also pose difficulties for PAR use. In East Africa, navigating group dynamics was a challenge because some farmers were not keen on cooperating with group work that required labor.

Another common challenge mentioned across regions were logistical factors, specifically time constraints and funding. Multiple regions expressed that while PAR is beneficial, it is a time intensive process, and is difficult to complete under short project cycles. Therefore, longer project timelines are conducive for PAR use. In Southeast Asia and East Africa, funding for gender components was expressed as a challenge, emphasizing the need to include gender activities in the budget from the start. The external enabling environment can also be a challenge if there is a lack of involvement from stakeholders.

Recommendations

East Africa

The local partner recommended that more financial management be given to community groups, that more male farmers become involved in the program since they equally need trainings on CSA, and that the area of operation be increased to reach more farmers. Additionally, increasing innovation funds to assist in the implementation of CSA activities,

providing more trainings on CSA innovations, and increasing awareness to youths that agriculture can be a source of self-employment and income.

West Africa

A key recommendation is that at every stage of an intervention, it's necessary to include men, women, and youth at the very beginning. Secondly, gender should be mainstreamed into the design to ensure that it is actually implemented. Value chains that are women-sensitive should be utilized more. Additionally, future projects should address the constraints that women face and develop a mechanism to overcome them. Future work needs to expand the domain of possible activities for women and youth.

Latin America

The regional team recommended that CIAT have a presence at the local level and emphasized that researchers need to listen to the local partners and communities to be mindful of their needs. They also recommended that future projects consider the different timeframes that they manage with respect to the community and local partners and other stakeholders and be mindful that while for CCAFS research is the main priority, research is not the main priority for local partners. It is important to be mindful of this dynamic and the differing priorities.

Local partners noted that future projects should insist on the participation of younger generations, extend the research time for each practice in order to offer more solid results, and provide ongoing training of technicians to use PAR approaches with ease. Additionally, the capacity of local communities as managers of change and direct contributors to citizen science should be much more highly valued.

South Asia

A local partner recommended that more emphasis be given to site-specific government agriculture departments, and that projects should align with state policies and schemes for quicker diffusion. Generating information on the benefits of GSI and sharing it further with stakeholders was also recommended, as was giving women farmers priority at every step of the project. Regarding PAR, a local partner noted that the engagement of key stakeholders is a must for the sustainability and scaling of the projects on a wider scale.

Southeast Asia

The regional SEA team recommended there be specific monitoring for GSI itself and that gender participation in CSV activities be equal. Local partners added that gender roles need to be emphasized and detailed at an early stage so gender equity can be practiced throughout the implementation process, in order to contribute towards the goal of women farmers benefitting as equally as men. Providing special training on gender and social inclusion directed towards those at the implementation level (not only management and governance levels) was also recommended.

A local partner also recommended improving systematic engagement with provincial and district level officials in order to achieve agreement on activities and leverage it for joint implementation. Benefits for local governments should also be highlighted at an early stage of a project so they will feel incentivized to cooperate with the project team. Securing allocation of funding for CSA adoption was also noted, as the transformation of livelihoods cannot solely be done by advocating for it or providing capacity development alone; small grants and community support funding is crucial for incubating CSA.

Lastly, focusing more on Participatory Monitoring and Evaluation (PME) and applying it beyond the promotion of CSA adoption to market analysis and market research for products was recommended by a local partner.

Conclusion

Participatory research approaches have been around for decades, and add much value to projects, as this report demonstrates. The use of PAR methods can increase adoption rates, facilitate social learning, and increase access to CIS information to inform better decision-making. It can also foster conversations around gender roles and dynamics, improve women and youth's participation in CSA activities, and contribute to scaling. Additionally, PAR can provide communities with a sense of ownership, which makes interventions more sustainable after the project cycle has ended.

Appendix

Appendix A: Data Collection Template

Title	Description	PAR processes	Data collected/ referenced	Stage(s) of inclusion		Action Area 1	Action Area 2	Action Area 3	Action Area 4	GED1: decision-making	GED2: control/access to resources	GED3: Easing workload	GED4: collective action	CSA practices and technologies		Key Outcomes		Limitations/ Considerations	URL	Author	Year	Region	Country	Resource type
				Gender	Youth									Gender-responsive	Youth-responsive	Gender	Youth							

Appendix B: Survey Sent to Local Partners

1. Name
2. Designation
3. Organization Name
4. Organization type (i.e. NGO/INGO, research organization, government, private sector, etc.)
5. CSV Name
6. The Climate-Smart Village approach developed by CCAFS has been an innovation. PAR played a key role to support the efforts towards co-developing/identifying, testing and promoting the adoption of CSA options at scale. In your experience, how was the use of Participatory Action Research different in the context of the CSV work, and to what extent were Gender and Social Inclusion (GSI) aspects included in the process?
7. What have been the main challenges when using PAR approaches in the CSVs?
8. What do you feel was done well when using PAR approaches and, more specifically, incorporating GSI aspects with the specific aim to support CSA adoption? What were the key successes?
9. Based on your experience, what should be done differently in the future regarding the use of PAR to promote adoption of CSA practices/technologies with an emphasis on Gender and Social Inclusion?
10. Did you incorporate gender and youth considerations in the identification, prioritization, testing and/or dissemination of CSA practices/technologies and/or climate information services? If yes, please explain how.
11. What have been the main challenges when trying to incorporate gender and youth considerations into the identification and promotion of CSA options?
12. What do you feel worked well? Can you provide the most successful examples of gender and youth responsive CSA technologies promoted in your specific CSVs?
13. Based on your experience, what should/could be done differently in the future regarding the prioritization, testing or promotion of gender and youth responsive CSA options?

14. As part of these reports we will also be highlighting some case studies from each region. Are there any success stories that you'd like to share? (If there is a resource written on it, feel free to answer with the title and author and/or the link to the document).

Appendix C: List of Resources Reviewed by Region

Citation	Link
East Africa	
Bamanyaki P, Muchunguzi P. 2020. Exploring gender- and nutrition-sensitive climate-smart agriculture value chains for Nwoya District, Northern Uganda. CCAFS Info Note. Wageningen, Netherlands: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).	https://cgspace.cgiar.org/handle/10568/111220
Murray U, Gebremedhin Z, Brychkova G, Spillane C. 2016. Smallholder farmers and climate smart agriculture: Technology and labor-productivity constraints amongst women smallholders in Malawi. Gender, Technology and Development 20(2):117–148.	https://cgspace.cgiar.org/handle/10568/78457
Beuchelt TD, Badstue L. 2013. Gender, nutrition- and climate-smart food production: opportunities and trade-offs. Food Security 5(5): 709-721.	https://cgspace.cgiar.org/handle/10568/33839
Shikuku, Kelvin M.; Mwongera, Caroline; Winowiecki, Leigh; Twyman, Jennifer; Läderach, Peter. 2016. Understanding farmers' indicators in climate-smart agriculture prioritization in the Southern Agricultural Growth Corridor of Tanzania (SAGCOT). Centro Internacional de Agricultura Tropical (CIAT), Cali, CO. 56 p. (Publicación CIAT No. 415)	https://cgspace.cgiar.org/handle/10568/72826
Bamanyaki PA. 2020. Barriers and opportunities for gender-responsive climate-smart agriculture adoption in Northern Uganda. CCAFS Info Note. Wageningen, Netherlands: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).	https://cgspace.cgiar.org/handle/10568/109811
Ojango JMK, Audho J, Oyieng E, Recha J, Muigai AWT. 2018. Innovative use of sheep and goats by women in climate smart villages in Kenya. Proceedings of the World Congress on Genetics Applied to Livestock Production, Volume Genetic gain - Strategies for Local Breeds 1: 985.	https://cgspace.cgiar.org/handle/10568/97552
Ambaw G, Tadesse M, Recha J. 2019. Activity Report: Implementation of the CSA Monitoring framework in Doyogena Climate-Smart Landscape, Ethiopia. Wageningen, the Netherlands: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).	https://cgspace.cgiar.org/handle/10568/106308

Huyer S, Nyasimi M. 2017. Gender and Social Inclusion. Climate-Smart Agriculture Manual for Agriculture Education in Zimbabwe. Copenhagen: Climate Technology Centre and Network.	https://cgspace.cgiar.org/handle/10568/89632
Makate, C., Makate, M., Mutenje, M., Mango, N. and Siziba, S., 2019. Synergistic impacts of agricultural credit and extension on adoption of climate-smart agricultural technologies in southern Africa. *Environmental Development*, *32*, p.100458.	https://www.sciencedirect.com/science/article/abs/pii/S2211464519301411#:~:text=Credit%20and%20extension%20access%20enhance,%2Dsmart%20agriculture%20(CSA).&text=Simultaneous%20access%20to%20credit%20and,CSA%20adoption%20than%20in%20isolation.&text=Education%2C%20transport%2C%20land%20size%20and,access%20to%20extension%20and%20credit.
Gotor E, Fadda C, Trincia C. 2014. Mathing Seeds to Needs - female farmers adapt to a changing climate in Ethiopia. Impact Assessment Briefs no 14. Rome, Italy: Bioversity International.	https://cgspace.cgiar.org/handle/10568/36173
Recha J, Radeny M, Kinyangi J, Kimeli P, Atakos V, Lyamchai C, Ngatoluwa R, Sayula G. 2015. Climate-smart villages and progress in achieving household food security in Lushoto, Tanzania. CCAFS Info Note. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).	https://cgspace.cgiar.org/handle/10568/70257
Bedmar Villanueva A, Jha Y, Ogwal-Omara R, Welch E, Sayoum Wedajoo A, Halewood M. 2016. Influence of social networks on the adoption of climate smart technologies in East Africa: Findings from two surveys and participatory exercises with farmers and local experts. CCAFS Info Note. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).	https://cgspace.cgiar.org/handle/10568/71146
Harahagazwe D, Quiroz R, Kuoko S, Recha J, Radeny M, Sayula G, Schulte-Geldermann E, Brush G, Msoka E, Rimoy M, Asfaw A, Bonierbale M, Atakos V, Kinyangi J, Exaud A. 2016. Participatory Evaluation of Resilient Potato Varieties in Climate-Smart Villages of Lushoto in Tanzania. CCAFS Working Paper no 192. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).	https://cgspace.cgiar.org/handle/10568/79454
Amsler K, Hein C, Klasek G. 2017. Youth Decision Making in Agricultural Adaptation to Climate Change. CCAFS Working Paper no. 206. Wageningen, the Netherlands CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).	https://cgspace.cgiar.org/handle/10568/88082
Recha J, Kimeli P, Atakos V, Radeny M, Mungai C. 2017. Stories of Success:Climate-Smart Villages in East Africa. Wageningen, Netherlands: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).	https://cgspace.cgiar.org/handle/10568/81030

Mungai C, Opondo M, Outa G, Nelson V, Nyasimi M, Kimeli P. 2017. Uptake of Climate-Smart Agriculture Through a Gendered Intersectionality Lens: Experiences from Western Kenya. In: Filho WL et al (eds.). 2017. Climate Change Adaptation in Africa: Fostering Resilience and Capacity to Adapt. Part II. Cham, Switzerland: Springer International Publishing. pp 587-601.	https://cgspace.cgiar.org/handle/10568/80807
Radeny M, Ogada MJ, Recha J, Kimeli P, Rao EJO, Solomon D. 2018. Uptake and Impact of Climate-Smart Agriculture Technologies and Innovations in East Africa. CCAFS Working Paper no. 251. Wageningen, Netherlands: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).	https://cgspace.cgiar.org/handle/10568/99267
Gumucio T, Hansen J, Rose A. 2019. Access and use of weather and climate information by women and men farmers: Rwanda Climate Services for Agriculture qualitative evaluation preliminary findings. CCAFS Info Note. Wageningen, Netherlands: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).	https://cgspace.cgiar.org/handle/10568/106892
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